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## Female-to-male transgender quality of life

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### Abstract

**Objectives:** We evaluated health-related quality of life in female-to-male (FTM) transgender individuals, using the Short-Form 36-Question Health Survey version 2 (SF-36v2). **Methods:** Using email, Internet bulletin boards, and postcards, we recruited individuals to an Internet site (<http://www.transurvey.org>), which contained a demographic survey and the SF36v2. We enrolled 446 FTM transgender and FTM transsexual participants, of which 384 were from the US. **Results:** Analysis of quality of life health concepts demonstrated statistically significant ( $p < 0.01$ ) diminished quality of life among the FTM transgender participants as compared to the US male and female population, particularly in regard to mental health. FTM transgender participants who received testosterone (67%) reported statistically significant higher quality of life scores ( $p < 0.01$ ) than those who had not received hormone therapy. **Conclusions:** FTM transgender participants reported significantly reduced mental health-related quality of life and require additional focus to determine the cause of this distress. Providing this community with the hormonal care they request is associated with improved quality of life.

**Key words:** Female, Female-to-male transgender, Gender identity, Internet, Male, Quality of life, Transgender, Transsexualism/psychology

**Abbreviations:** FTM – Female-to-male (FTM) transgender participants were labeled female at birth and choose to identify as male; HBGDA – The Harry Benjamin International Gender Dysphoria Association (HBGDA) is a US-based professional association for individuals that provide services to the transgender community; QOL – Health-related quality of life (QOL) is a way of defining the level of functioning and perceived well-being in an individual; SF36v2 – The Short Form 36-Item Questionnaire version 2 (SF36v2) is a health-related quality of life measurement tool containing 36 questions, that cover 8 domains of physical and mental health

### Background

Transgender is an umbrella term used to incorporate people of various gender identifications, including transsexuals, drag queens and drag kings, masculine women, feminine men, and others

who violate normative gender laws but who do not necessarily seek and/or obtain surgical and medical treatment. Transsexual is typically used to describe individuals who use both hormonal and surgical therapy to augment their bodies. A female-to-male transgender person (FTM) was

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labeled female at birth, and chooses to identify as male, whether or not he receives transgender medical treatment.

The present study focuses on FTM transgender health for several reasons. First, the literature is deficient in its ability to describe the positive and negative effects of transgender medical treatment, including the long-term effects of hormone use and sex-reassignment surgery. Second, active discrimination by health care providers creates an enormous barrier to prompt treatment of medical concerns [1, 2]. In addition, many health care professionals lack appropriate training regarding treatment protocols and health issues for transgender patients. Finally, transgender people are often isolated and marginalized within the community at large, known risk factors for poor health status [3, 4].

The Harry Benjamin International Gender Dysphoria Association (HBIGDA) is a US-based professional association for individuals who provide services to the transgender community. The organization creates transgender treatment protocols, and the HBIGDA Standards of Care state that the goal of transgender medical treatment is “lasting personal comfort with the gendered self in order to maximize overall psychological well-being and self-fulfillment” [5], which can be interpreted as improved quality of life. Quality of life (QOL) is a way of defining the level of functioning and perceived well-being in a patient population.

Sex reassignment therapy is an important aspect of transgender medical treatment and improved QOL following therapy has been demonstrated in a few small studies from Yugoslavia [6], Germany [7], and Sweden [8]. All of these works examined QOL in both female-to-male and male-to-female transgender people, and QOL was defined inconsistently and narrowly, including improved intimate relationships and work opportunities [6], limited medical complications and treatment side effects [7], and improved psychiatric functioning [8]. These results have limited application to a US population of transgender individuals because of the vast differences in care between European and American transgender people. In European countries that offer transgender treatment systems (including Holland, Sweden, and Belgium), patients are recruited into a single clinic, given state-funded, predictable care, and followed over time by a con-

sistent team of physicians and counselors. Most American transgender people receive health care in a rather unsystematic fashion and are fortunate to find a sensitive, non-discriminatory primary care physician who is familiar with a transgender treatment protocol. US private health insurance typically does not cover the costs of hormone or surgical treatment because the treatment is considered cosmetic, and therefore, unnecessary. Some state-based public health systems, such as California’s Medi-Cal insurance program, will pay for hormone and surgical therapy for indigent transgender people but review requests for care on a case-by-case basis and often deny them.

Although many European transgender patients can depend on a dedicated medical team focused exclusively on their care, qualitative research has affirmed that US transgender people routinely experience discriminatory practices and provider insensitivity when accessing health care services [9, 10]. Because American transgender patients cannot rely on a supportive health care system, their QOL may suffer substantially. Therefore, an important aspect of this study is an examination of the association between QOL and the receipt of sex reassignment therapies in American FTMs.

## Objectives

To examine QOL in the female-to-male transgender community, we used the Short Form 36-Item Questionnaire version 2 (SF36v2) [11] via the Internet to evaluate eight domains of health-related quality of life. The SF36v2 is a generic, valid, accessible, and clinically relevant tool for assessing QOL in a population. The Internet is an excellent tool for transgender health research because the transgender community relies heavily on the Internet for information gathering and social networking [12]. In addition, the appropriateness of using the SF36v2 as an Internet-based tool has been tested [13].

The current study had two objectives. The first objective was to examine QOL in FTM transgender people, and the empirical question of whether FTM QOL (as related by the SF36v2 health concepts) differs from the general US population of men and women. One might expect FTMs to report lower levels of QOL than the general

population, because of social discrimination and stigmatization, as seen in other US communities that experience prejudice [14]. Alternatively, we do not believe FTM transgender identity to be indicative of psychopathology or a disease state. This presumption is supported by data from European population-based studies of the FTM transgender community, which demonstrate no statistically significant increases in mortality or morbidity when compared against the female population as a whole [15].

The second objective was to examine differences in QOL within groups in the FTM population. We expected FTMs who are in the first 2 years of sex reassignment treatment to report lower health-related QOL compared with those who are further along in the gender transition process. We based this hypothesis on the understanding that gender transformation can be a difficult process, sometimes involving complicated and debilitating surgeries, and that transgender individuals experience decreased social and familial acceptance and support [10, 16].

## Methods

### *Participants and procedures*

To enroll in the study, FTM transgender individuals were directed to the secure website <http://www.transurvey.org>. We conducted recruitment via online promotion and printed materials, including flyers and postcards that were distributed to San Francisco Bay Area community centers, cafes, stores, and health clinics that serve the transgender community. We encouraged participation by individuals who currently identify as female-to-male transgender or transsexual, or have identified as FTM in the past and now identify as male. We required a unique user name and password to advance beyond the home page of the website. Although this procedure helped prevent duplicate submissions by the same participant, we could not employ more sophisticated computerized systems due to administrative and financial constraints. We ensured voluntary enrollment in this study by using an Informed Consent web page, that contained the University of California at Berkeley Committee for the Protection of Human Subjects

and University of California at San Francisco Committee on Human Research approved text. Users who did not click the “I Consent” button could not advance to the remainder of the study. Participants who completed both the requirements for user identification and informed consent were allowed access to the Demographics and Health Survey portions of the study. Our web version of the SF36v2 closely approximates the design of the paper version and we did not modify the questions from their published wording and format. After submitting their SF36v2 responses, users were offered a real-time report of their SF36v2 responses, along with comparison data for men and women in the participant’s age category. Quality Metric Incorporated, the creators and managers of the SF36v2, provided the comparison data. All participants received a discount coupon redeemable at an Internet store.

### *Measures*

The Demographics section assessed subject information about age, education, race, income, gender identity, country of origin, locale, testosterone use, receipt of surgery, insurance status, and experience of health care discrimination. Health-related QOL was determined using the Short-Form 36 Version 2 [11]. The SF36v2 measures health using questions to assess eight domains. Table 1 explains each of these domains with an associated sample question from the survey.

The SF36v2 relies on a norm-based scoring method, incorporating general United States population health norms (obtained from the 1998 National Survey of Functional Health Status) into the scoring so that all SF36v2 domains have a mean of 50 and standard deviation of 10 [17]. Norm-based scoring enables easier interpretation of changes in QOL, as all scores above or below 50 are equivalent to above or below the population norm.

### *Statistical analyses*

We downloaded data as a text file from the secure website and imported the data into SPSS 12.0 for Windows (SPSS Inc, Chicago, IL) and Intercooled Stata 7 (Statacorp LP, College Station, TX) for analyses. We used independent samples *T*-tests and one-way ANOVAs to determine significant

**Table 1.** SF-36v2 domains and sample questions

Domain	Sample question
<i>Physical Functioning</i> : evaluates aspects of physical limitations, both minor and severe	Does your health now limit you in vigorous activities, such as running, lifting heavy objects, participating in strenuous sports?
<i>Role Physical</i> : assesses limitations in work or activities due to physical health problems	During the past 4 weeks, how much of the time have had any of the following problems with your work or other regular daily activities as a result of your physical health?
<i>Bodily Pain</i> : measures intensity and impact of pain	How much bodily pain have you had during the past 4 weeks? How much did pain interfere with your normal work (including both work outside the home and housework)?
<i>General Health</i> : assesses individual's perception of well-being	In general would you say your health is excellent, very good, good, fair, or poor?
<i>Vitality</i> : measures energy and fatigue, as well as impact of disease or treatment on health	How much of the time in the past 4 weeks did you feel full of life?
<i>Social Functioning</i> : measures impact of health on social activities	During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?
<i>Role Emotional</i> : to assess limitations in work or activities due to mental health problems	During the past 4 weeks, how much of the time have had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?
<i>Mental Health</i> : assesses overall mental health	How much of the time in the past four weeks have you been very nervous?

QOL differences in the study sample. Because our analyses were largely exploratory, statistical significance was set at  $\alpha=0.01$ , instead of the usual  $\alpha=0.05$ . Furthermore, because we conducted multiple statistical tests in the age-based analyses, we used the Bonferroni correction procedure to adjust the  $\alpha$  level downwards ( $\alpha=0.00125$ ) and correct for an increased chance of Type I error.

## Results

### *Participant characteristics*

Between October 2003 and October 2004, 446 individuals completed the survey hosted on the study website. Table 2 presents the characteristics of all participants. The average participant was in his thirties, identified as white, lived in an urban area, and had health insurance. Because “Date of Birth” was the only required field for advancement to the QOL survey, not all participants answered every question of the demographic survey.

### *Quality of life outcomes*

#### *Overall norms*

Given that the comparison health norms are from a US sample, we chose to analyze health-related

QOL for the US members of our study sample only ( $n = 384$ ). Of the 384 US subjects, we excluded four individuals who identified as “female” and one subject who did not submit gender identity information. Additionally, three subjects submitted incomplete quality of life surveys and we could not evaluate their responses for all quality of life domains (Table 3). Therefore, our final sample for quality of life data analysis was  $n = 376$ . For all health domains except Role Physical and Bodily Pain, the transgender group differs significantly from the general population. For the mental health concepts (Vitality, Role Emotional, Mental Health, and Mental Health Summary Score) and for Social Functioning (which reflects physical and/or emotional impact on social activities) FTMs in our sample reported lower QOL than the general population, reflecting diminished mental-health related QOL. For the Physical Functioning concept and the Physical Health Summary Score, FTMs in our sample reported significantly higher scores than the general US population.

#### *Age-specific QOL norms*

To investigate the effect of age on QOL scores, we compared our FTM transgender sample to males and females in specific age groups, using norms for

**Table 2.** FTM transgender study participant characteristics at enrollment

	n (%)	All participants (n = 446)	US participants, FTM or male identified only (n = 379)
Country of origin (n = 444)			
United States	384 (86.5)		
Canada	40 (9.0)		
European Union	11 (2.5)		
Other	9 (2.0)		
Gender identity (n = 443)	n (%)		
Female-to-male transsexual	180 (40.6)		
Female-to-male transgender	178 (40.2)		
Male	80 (18.1)		
Female	5 (1.1)		
Age, mean (SD)	32.8 (11.2)		
Area of residence, n (%)			
Urban	352 (79.6)		
Rural	90 (20.4)		
Testosterone usage, n (%)			
Ever	301 (68.1)		
Current	286 (64.7)		
Surgical procedures, n (%)			
Top surgery	164 (37)		
Bottom surgery	12 (3)		
Health insurance, n (%)			
Yes	326 (74.8)		
No	100 (22.9)		
Don't know	10 (2.3)		
Race, n (%)			
White	358 (90.4)		
Latino	13 (3.3)		
African-American	6 (1.5)		
Asian	6 (1.5)		
Other	13 (3.3)		
Education, n (%)			
≥High school	386 (88)		
< High school	54 (12)		
Annual household income, n (%)			
≤ \$19,999	173 (40.0)		
> \$20,000	259 (60.0)		
Health care discrimination, n (%)			
Experienced discrimination from provider	74 (16.7)		
Delayed seeking care due to fear of discrimination	312 (70.7)		

subgroups of the US general population (Tables 4 and 5). As a whole, FTM health-related QOL scores showed fewer statistically significant differences from US female scores than from US male scores. FTM transgender people age 44 and younger scored significantly lower than US males and females in the Social Functioning, Role Emotional, Mental Health, and Mental Health Summary Score domains, which are designed to be the dominant mental health domains in the survey. Although FTMs reported significantly lower scores in the General Health and Vitality domains

when compared to males in their age group, no statistically significant differences were found between FTMs and females in any age group for the physical health QOL domains.

#### *Hormone therapy*

We evaluated subgroups of our FTM transgender sample with the goal of determining whether hormone therapy influences QOL. Those who had received testosterone at any time reported higher health-related QOL scores than those who had not, with statistically significant differences

**Table 3.** Health-related quality of life in a US female-to-male transgender sample (n = 376)

Health concepts	Mean (SD) <sup>a</sup>	Test statistic <sup>b</sup>	p Value <sup>b</sup>
General Health	47.76 (10.5)	-4.2259	< 0.001
Physical Functioning	51.79 (7.6)	3.4299	< 0.001
Role Physical	50.59 (8.8)	1.124	0.261
Bodily Pain	49.73 (9.9)	-0.5117	0.608
Vitality	46.22 (9.9)	-7.1617	< 0.001
Social Functioning	43.14 (10.9)	-12.928	< 0.001
Role Emotional	42.42 (11.6)	-14.192	< 0.001
Mental Health	42.12 (10.2)	-14.907	< 0.001
Physical Summary Score	53.45 (9.42)	6.700	< 0.001
Mental Summary Score	39.63 (12.2)	-19.317	< 0.001

<sup>a</sup>SD = standard deviation.

<sup>b</sup>Based on independent samples *T*-test, comparing the FTM sample to the US general population norms. The mean and standard deviation for the comparison sample are 50 and 10, respectively, for all health concepts.

( $p < 0.01$ ) in the Vitality, Social Functioning, Role Emotional, and Mental Health domains. When we controlled for the possible influence of income and education on quality of life, we found that testosterone usage independently predicts higher quality of life scores ( $p < 0.01$ ) in the Social Functioning, Mental Health, and Mental Health Summary domains, with marginal statistical significance ( $p < 0.05$ ) in the Vitality and Role Emotional domains (Table 6).

Most FTM study participants who had used testosterone at any time reported taking testosterone for less than 5 years (n = 203). The overwhelming majority of these subjects (76%) were 40-years-old or younger. When we examined QOL differences between testosterone users based on their length of treatment, the only statistically significant differences we found were in the Physical Functioning and Physical Health Summary Score for individuals who had used testosterone for more than 15 years. These individuals also were more likely to be 50-years-old or older. When the treatment length categories were collapsed into  $\leq 1$  year and  $> 1$  year, individuals with  $> 1$  year of treatment reported statistically significant higher scores only in Role Emotional domain ( $p = 0.047$ ).

#### *Surgical treatment*

We focused our surgical treatment analysis on those who reported having undergone “top” surgery (mastectomy or chest reconstruction). Chest reconstruction not only enhances the FTM transgender identity, increases self-esteem, and improves

body image, but provides some security and safety for those who remove their shirts in public areas, such as gyms or beaches. Those who had received top surgery reported higher QOL scores than those who had not received surgery, with statistically significant findings ( $p < 0.01$ ) for the General Health, Social Functioning, and all three mental health concepts. Univariate analyses controlling for possible influence of income and education on quality of life revealed top surgery to be an independent predictor of quality of life only in the General Health domain (Table 7). When we analyzed QOL based on the length of time since surgery, we found no statistically significant differences across time. Most participants (50%) reported receiving top surgery in the past year, and 84% had received surgery in the past 4 years. When the surgical time variable was collapsed into those who had surgery 1 year ago or less and those who had surgery more than 1 year ago, no statistically significant differences in QOL were observed.

#### **Discussion**

The 376 US FTM transgender participants analyzed in this sample had diminished mental-health related QOL compared with the general US population, as measured by the SF36v2. These findings are consistent when compared against specific age and sex norms. This study did not reveal whether the mental health distress reported by this sample of FTMs is generated by internal conflict regarding gender identity, as suggested by the

**Table 4.** FTM transgender health-related quality of life compared with US population norms for males

Health concept	Ages 18–24		Ages 25–34		Ages 35–44		Ages 45–54	
	FTM (N = 111)	National norm (N = 50)	FTM (N = 133)	National norm (N = 419)	FTM (N = 86)	National norm (N = 700)	FTM (N = 34)	National norm (N = 543)
General Health	<b>46.88 (9.99)</b>	52.02 (8.22)	<b>48.04 (10.69)</b>	52.5 (8.46)	48.73 (10.47)	51.75 (9.21)	47.39 (12.08)	50.27 (9.99)
Physical Functioning	<b>53.52 (5.45)</b>	54.26 (7.22)	<b>52.89 (6.31)</b>	54.56 (6.16)	50.83 (8.92)	53.48 (6.45)	49.41 (9.61)	51.38 (8.6)
Role Physical	<b>51.17 (8.19)</b>	54.5 (6.3)	<b>51.6 (7.26)</b>	53.64 (6.96)	50.29 (9.895)	52.86 (7.85)	47.41 (11.00)	51.06 (9.45)
Body Pain	50.05 (8.82)	51.71 (8.42)	51.47 (8.63)	53.18 (8.7)	49.09 (11.26)	51.49 (8.92)	45.42 (10.27)	50.39 (9.69)
Vitality	45.25 (9.98)	49.86 (9.65)	<b>46.52 (8.91)</b>	51.58 (8.51)	<b>46.91 (10.45)</b>	51.41 (9.5)	46.58 (12.84)	51.63 (10.14)
Social Functioning	<b>42.69 (10.64)</b>	50.84 (7.0)	<b>42.70 (10.66)</b>	52.46 (7.43)	<b>44.74 (10.66)</b>	51.41 (8.78)	<b>42.57 (13.29)</b>	50.43 (10.25)
Role Emotional	<b>40.18 (11.52)</b>	52.69 (5.93)	<b>41.73 (10.91)</b>	52.79 (7.0)	<b>45.55 (11.94)</b>	51.9 (8.14)	<b>43.87 (12.67)</b>	51.06 (9.42)
Mental Health	<b>40.46 (10.14)</b>	49.76 (8.33)	<b>43.21 (9.01)</b>	51.28 (8.35)	<b>42.29 (10.43)</b>	50.36 (9.67)	<b>42.88 (13.62)</b>	50.79 (10.12)
Physical Health Summary Score	55.07 (7.84)	53.96 (7)	54.86 (7.74)	54.05 (6.63)	52.27 (11.01)	52.98 (7.6)	49.44 (10.80)	50.81 (9.37)
Mental Health Summary Score	<b>37.05 (12.22)</b>	49.51 (7.14)	<b>39.34 (11.11)</b>	51.02 (7.64)	<b>41.99 (11.93)</b>	50.39 (9.56)	<b>42.02 (15.40)</b>	50.85 (10.05)

Total number of individuals analyzed = 364 (12 US FTM participants submitted incomplete demographics and/or quality of life surveys).

Data presented as quality of life score mean (standard deviation).

Numbers in bold represent statistically significant differences in mean scores ( $p < 0.00125$ ), based on independent sample *T*-tests.

DSM-IV and members of the psychiatric community, or is the result of discrimination and social alienation. Regardless of the root cause of the mental health distress, FTM transgender people would benefit from greater access to the full spectrum of health services to help alleviate their distress.

Overall, in our FTM transgender sample physical well-being does not appear to be diminished. When compared with men in their same age category, FTMs in this sample appear to have diminished physical health. This decreased physical health is not seen when they are compared with women in their age category. Because FTM people are biologically female, they may be more physically similar to women than to men.

Our second objective was to examine whether individuals in the first few years of gender transition report diminished QOL. We found no significant relationship between treatment length and QOL, although in this sample receiving hormone therapy was significantly associated with increased well-being, independent of socioeconomic status. This point is important because many health insurance plans refuse to pay for transgender-specific treatment without considering the impact on QOL. FTM transgender people are requesting services that are not incidental, cosmetic remedies, but rather therapies key to their well-being. Unfortunately, this work does not determine whether FTMs who seek and obtain medical services directly related to their transgender identity experience are psychologically healthier at baseline than FTMs who do not, or cannot, seek the same care.

### Study strengths

For the first time, a large sample of data regarding the FTM transgender community is available for analysis. These data reveal issues and concerns specific to the FTM transgender community and highlight the particular struggles of the community. For example, although our study participants are highly educated (48% having received a bachelor's degree or higher), the majority earn less than the US national average.

By using the Internet as a survey tool, we have gathered information about FTMs from 40 states

**Table 5.** FTM transgender health-related quality of life compared with US population norms for females

Health concept	Ages 18-24		Ages 25-34		Ages 35-44		Ages 45-54	
	FTM (N = 111)	National norm (N = 157)	FTM (N = 133)	National norm (N = 619)	FTM (N = 86)	National norm (N = 820)	FTM (N = 34)	National norm (N = 873)
General Health	46.88 (9.99)	48.14 (9.55)	48.04 (10.69)	50.86 (9.61)	48.73 (10.47)	50.15 (9.8)	47.39 (12.08)	49.23 (10.66)
Physical Functioning	53.52 (5.45)	53.04 (6.56)	52.89 (6.31)	52.96 (7.16)	50.83 (8.92)	51.4 (8.59)	49.41 (9.61)	48.63 (10.06)
Role Physical	51.17 (8.19)	51.66 (7.98)	51.6 (7.26)	51.73 (8.76)	50.29 (9.895)	51.35 (8.75)	47.41 (11.00)	49.56 (10.18)
Bodily Pain	50.05 (8.82)	51.89 (8.43)	51.47 (8.63)	51.44 (9.64)	49.09 (11.26)	49.95 (9.64)	45.42 (10.27)	48.07 (10.29)
Vitality	45.25 (9.98)	45.65 (8.82)	46.52 (8.91)	48.08 (10.11)	46.91 (10.45)	48.36 (9.92)	46.58 (12.84)	49.37 (9.98)
Social Functioning	<b>42.69 (10.64)</b>	48.26 (10.72)	<b>42.70 (10.66)</b>	49.43 (9.94)	<b>44.74 (10.66)</b>	49.3 (10.14)	<b>42.57 (13.29)</b>	49.69 (10.12)
Role Emotional	<b>40.18 (11.52)</b>	48.26 (10.92)	<b>41.73 (10.91)</b>	49.71 (9.64)	<b>45.55 (11.94)</b>	49.91 (9.62)	<b>43.87 (12.67)</b>	50.22 (9.9)
Mental Health	<b>40.46 (10.14)</b>	45.34 (10.74)	<b>43.21 (9.01)</b>	47.78 (10.6)	<b>42.29 (10.43)</b>	47.74 (10.45)	<b>42.88 (13.62)</b>	49.6 (9.96)
Physical Health Summary Score	55.07 (7.84)	53.26 (7.18)	54.86 (7.74)	53.03 (7.91)	52.27 (11.01)	51.56 (8.62)	49.44 (10.80)	48.49 (10.47)
Mental Health Summary Score	<b>37.05 (12.22)</b>	44.43 (11.41)	<b>39.34 (11.11)</b>	47.14 (10.74)	<b>41.99 (11.93)</b>	47.80 (10.35)	<b>42.02 (15.40)</b>	50.24 (9.84)

Total number of individuals analyzed = 364 (112 FTM participants submitted incomplete demographics and/or quality of life surveys).

Data presented as quality of life score mean (standard deviation).

Numbers in bold represent statistically significant differences in mean scores ( $p < 0.00125$ ), based on independent sample *T*-tests.

which makes this one of the broadest samples of FTMs ever recruited. The finding that 20% of transsurvey respondents live in rural settings provides evidence that transgender people inhabit many different communities in the United States, not just the urban environments that are assumed to be more hospitable to gender variant individuals.

This project recruited all individuals who presently identify as FTM transgender or transsexual, and specifically encouraged enrollment among individuals who currently identify as male, but who have identified as transgender in the past. Nearly 20% of our enrolled participants currently identify as male, but most continue to take hormone therapy to support their bodily transformation. This finding demonstrates that a significant number of an FTM transgender target sample may be difficult to locate if research focuses solely on those who identify currently as transgender and fails to include those who have a transgender history.

The greatest strength of this project is its ability to clarify some of the health needs and issues for FTM transgender people. This information can be used to educate the health care and transgender communities, as well as to support future funding applications for more comprehensive projects around transgender health.

### Study limitations

This survey, as with all research pertaining to the transgender community, is biased by self-selection. To be transgender is to identify as such – there is no particular physical finding or diagnostic test that can certify that an individual is truly the gender he or she reports to be. Therefore, we consider all individuals who believe they meet inclusion criteria as valid participants in this study. Clearly, there is a significant opportunity for individuals to falsify their identity in order to participate. Our approach is to trust that those who participate are doing so because of their desire to contribute to the body of transgender-focused research.

This project is limited by its mode of recruitment. Those who can successfully navigate the Internet for information gathering (such as email

**Table 6.** Health-related quality of life in a US female-to-male transgender sample, according to testosterone therapy

Health concepts	Ever received testosterone (n = 248) <sup>a</sup>	No testosterone usage (n = 117) <sup>a</sup>	F statistic	p Value <sup>b</sup>
General Health	48.34 (10.3)	45.92 (11.1)	2.399	0.122
Physical Functioning	52.34 (7.4)	51.10 (7.8)	0.805	0.370
Role Physical	50.38 (9.3)	50.69 (7.9)	0.761	0.384
Bodily Pain	49.70 (10.1)	49.54 (9.7)	0.689	0.407
Vitality	47.11 (9.7)	44.11 (10.5)	4.679	0.031
Social Functioning	44.34 (10.3)	40.30 (11.8)	8.063	0.005
Role Emotional	43.69 (11.5)	39.76 (11.6)	6.340	0.012
Mental Health	43.23 (9.8)	39.52 (10.9)	7.042	0.008
Physical Summary Score	53.29 (9.6)	53.67 (9.2)	0.887	0.347
Mental Summary Score	41.22 (11.9)	36.08 (12.6)	10.986	0.001

Hormone usage and quality of life scores available for 365 US FTM or male identified study participants.

<sup>a</sup>Mean quality of life score (standard deviation).

<sup>b</sup>Based on univariate analysis of variance, controlling for income and education.

lists and web-based organizations) automatically have a certain degree of literacy and technological sophistication. Internet access requires a computer, which for many is still a luxury item. This limitation may be the source of our racially-biased sample; more individuals report living in Canada than identify as African-American. Unfortunately, there are no comparable FTM transgender population data in the research literature to help us evaluate the impact of recruitment bias on our study sample.

The issues of potential bias are significant and, as such, the results reported here may not reflect the health and well-being of the entire FTM transgender community, but only the experiences of white, educated, urban FTMs. Given that American non-whites report mental health distress

more frequently than whites, regardless of socio-economic status [18], it is possible that FTMs of color, who are not well-represented in this study, may report even lower mental health-related quality of life than white FTMs.

Another significant limitation of this project is the use of the SF36v2 as our QOL measurement tool. Although we appreciate the SF36v2 for its generic language, its self-administering capacity, its validity, and its proven use as a web-based instrument, we recognize that it is not a diagnostic tool. Even though low scores on the SF36v2 mental health domains are correlated with poor mental health outcomes (i.e., in-patient mental health care, suicidal ideation, clinical depression) [11], this study does not help us understand specific mental disorders that may be present in the

**Table 7.** Health-related quality of life in a US female-to-male transgender sample, according to top surgery

Health concepts	Ever received top surgery (n = 136) <sup>a</sup>	No top surgery (n = 230) <sup>a</sup>	F statistic	p Value <sup>b</sup>
General Health	50.10 (9.6)	46.07 (10.8)	7.633	0.006
Physical Functioning	52.74 (7.1)	51.47 (7.8)	0.509	0.476
Role Physical	51.15 (9.2)	50.09 (8.7)	0.004	0.948
Bodily Pain	50.61 (10.1)	49.08 (9.8)	0.004	0.951
Vitality	48.41 (9.4)	44.81 (10.2)	4.596	0.033
Social Functioning	45.05 (10.6)	41.85 (11.0)	1.633	0.202
Role Emotional	44.32 (11.4)	41.30 (11.7)	1.105	0.294
Mental Health	44.25 (9.2)	40.73 (10.7)	3.575	0.059
Physical Summary Score	54.13 (9.4)	52.98 (9.5)	0.185	0.667
Mental Summary Score	42.21 (11.6)	38.01 (12.5)	3.364	0.067

Surgery information and quality of life scores available for 366 US FTM or male identified study participants.

<sup>a</sup>Mean quality of life score (standard deviation).

<sup>b</sup>Based on univariate analysis of variance, controlling for income and education.

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community. Our significant findings in the mental health domains demand that the FTM community be screened with psychological indices and scales to identify the particular mental health problems within the community.

### Future research

If the research goal is to evaluate QOL in a transgender population, an ideal project would recruit individuals when they first contact a health care provider and follow those individuals forward through their transition. Health-related QOL assessment at different stages of the transition period, in conjunction with detailed interviews, would help evaluate the relationship between gender identity and the physical and psychological changes that accompany the transition. Of course, this approach limits enrollment to those FTMs who have access to a physician, and excludes those who identify as transgender but who do not seek medical treatment.

We know from our analyses that those who receive hormone treatment report better QOL than those who have not, but we do not know the number of FTMs who desire care and have not been able to obtain it, or those who anticipate receiving care in the future. We also do not have information regarding the quality of intimate relationships and whether those relationships have experienced turmoil during their transgender transition period. A more complete understanding of this community would include a qualitative investigation of QOL.

Detailed interviews are essential for the generation of research tools specific to the FTM transgender community. Future projects should begin by organizing focus groups of FTMs of different ages and identities with the goal of critiquing and altering demographic surveys and QOL tools. This approach would not only create a community investment in the project, but also would generate results that more accurately reflect the FTM experience.

### Conclusions

This project's success provides us with information about the FTM transgender community that was

previously unavailable and demonstrates the feasibility of Internet-based health research. By highlighting the particular health needs of FTM people, we can advocate for enhanced services, targeted programs, and future research projects. Participants routinely expressed gratitude and enthusiasm for this survey, which informs us that the transgender community desires the concerned focus of the medical community and is willing to participate in future projects. The need for information and for improved relationships with the medical community is great.

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